

# PAEDIATRIC RESEARCH UNIT

PAUL E. POLANI, M.D., F.R.C.P., D.C.H.  
PRINCE PHILIP PROFESSOR OF PAEDIATRIC RESEARCH  
IN THE UNIVERSITY OF LONDON

GUY'S HOSPITAL MEDICAL SCHOOL,  
GUY'S HOSPITAL,  
LONDON, S.E.1.

HOP 7600  
EXT: 478, 482.

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Dear Professor Lederberg,

Please forgive my delay in answering your note at the foot of my letter of the 21st February. Thank you very much for the extra reprint.

I am not sure that the evidence on chromosome No.21 carrying a nucleolar organiser is watertight, although it is probable that it is so. Levan and Hsu, writing in the early days of human cytogenetics and before the Denver convention of nomenclature was introduced, thought that in their material chromosome No.22 was the one that often carried remnants of nucleolar material. (Levan, A. and Hsu, T.C. (1959) The human idiogram. *Hereditas* 45, 665-674 (p.672).) We have thought since then that nucleolar remnants could be found in association with any of the four small acrocentric chromosomes, and sometimes also with the medium-sized acrocentric ones. These remnants are visible when these chromosomes associate together and form a "ring-o'-roses" within the cells from cultures. These figures are well known and many people have described them, among others, Ferguson-Smith. (Ferguson-Smith, M.A. and Handmaker, S.D. (1961) Observations on the satellited human chromosomes.

I should be delighted, if you wish, to send you some photographs for you to see what you think of these remnants which are not unreasonably interpreted as nucleolar.

The fact that the secondary constrictions seen on the chromosomes bearing satellites are in other organisms, particularly plants, known to be the site of nucleolar organisation perhaps lends support to these views. You will find references to the nucleolar organisers in relation to secondary constrictions in both Darlington's and Swanson's book :- Darlington, C.D. (1937) *Recent Advances in Cytology*, Churchill, London; Swanson, C.P. (1958) *Cytology and Cytogenetics*, Macmillan, London.

If I can be of any further assistance please let me know, for I should indeed be very interested to hear your views on this unsettled but important topic.

I am enclosing a collection of reprints. I do not know whether these are of any interest, but I shall have pleasure in putting you on our mailing list.

Enclosures:

Yours sincerely,

Professor J. Lederberg,  
Department of Genetics,  
Stanford University Medical Center,  
Palo Alto, California, U.S.A.

*P. E. Polani*  
PAUL E. POLANI

PEP/DAB

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Polani, P. E.